ABSTRACT OF THE DISCLOSURE

An electrochemical cell for detection and quantification of analytes in a liquid sample, particularly a liquid sample having a small volume. In a preferred embodiment, the electrochemical cell comprises an assembly of conducting layers and insulating layers. The electrochemical cell can be formed by depositing conducting materials and insulating materials in alternating layers on an insulating substrate. It is preferred that the layer furthest from the insulating substrate be an insulating layer to minimize the damage of the conducting layers during handling of the electrochemical cell. A passage can be formed through the conducting layers and the insulating layers to expose the edges of the layers, which collectively form the wall or walls of the passage. The exposed edges of the conducting layers form the electrodes of the electrochemical cell. The electrochemical cell comprises at least one working electrode and at least one other electrode, e.g., a dual-purpose reference/counter electrode. In another embodiment, the assembly of conducting layers and insulating layers can be formed on both major surfaces of the insulating substrate. The assembly can comprise at least one working electrode and at least one other electrode, e.g., a dual-purpose reference/counter electrode.